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10/628,110	07/28/2003	Sergey Gazenko		3544

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Sergey Gazenko
1106 Park Side Ln.
Mason, OH 45040

EXAMINER	
HARLE, JENNIFER I	

ART UNIT	PAPER NUMBER
1654	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/628,110	GAZENKO, SERGEY	
	Examiner	Art Unit	
	Jennifer I. Harle	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-5 are pending. Claims 1-5 are rejected.

Priority

1. Applicant has requested in a letter dated July 23, 2003, that a priority date of July 1, 2003 be conferred upon the instant application based upon filing of his Disclosure Document No. 534252. However, Disclosure Documents **are not** patent applications and the date of its receipt in the United States Patent and Trademark Office **will not** become the effective filing date of any patent application subsequently filed. See MPEP 1706 [R-2] Disclosure Documents and MPEP 1706 [R-2] I. The Program. Thus, the request for priority is denied.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "frame", "the solid nutrient media", "optical instruments", "live cells", "micro colonies", "small and thin channels", "light", "liquid nutrient media", "examined surface", "artificial substrate" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional

replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

3. The abstract of the disclosure is objected to because it compares the invention to the prior art. Additionally, the abstract should include the machine or apparatus, its organization and operation, i.e. the device being claimed. More appropriate language would read – Growth of microorganisms in micro channels permits a change in the number of cells to accomplish light

absorbance. Fewer cells need a shorter time to reproduce. Thus detection and counting of cells can be accomplished in a rapid fashion. Correction is required. See MPEP § 608.01(b).

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(e) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(f) BRIEF SUMMARY OF THE INVENTION.
(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(h) DETAILED DESCRIPTION OF THE INVENTION.
(i) CLAIM OR CLAIMS (commencing on a separate sheet).
(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Content of Specification

(a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should

be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.

(b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.

(c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.

(d) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

Or alternatively, Reference to a "Microfiche Appendix": See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.

(e) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."

(2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

(f) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

(g) **Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.**

(h) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

(i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

(j) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

(k) Sequence Listing, See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

4. The disclosure is objected to because of the following informalities:

(b) Cross-References to Related Applications: The disclosure document is not a priority document and therefore priority can not be claimed.

(e) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:

(1) Field of the Invention: This appears to be what has been done under this section.

(2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

This is missing and it appears as if Applicant is aware of known related art, and could refer to specific related art. See http:/www.biotk.com/parterning_details.php?id=15, which refers to the fact that "Basic ideas of MCA technology have been patented. Dr. Gazenko is a single author."

(f) Brief Summary of the Invention: This section is not a brief summary but rather a detailed description of the invention. It should merely set forth a brief summary or general description but rather it goes into calculations and tables that would be better served under the Detailed Description.

(g) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f).

A Brief Description of the Drawings is missing.

Appropriate correction is required.

5. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification

are: itched long channels, TSA, CFU, inoculation, enumeration, H202 by Catalase, use of filter is confusing in connection with Specification and drawings. Additionally, the Specification is replete with grammatical and spelling errors making it difficult to fully comprehend the meaning, verbs are missing, sentences are incomplete, references are made to objects that were not made before, phrasing is inconsistent with accepted or clear English, i.e. needful time. Sentences are confusing – "During this process, cells if any are caught in some of the channels of the micro channel plate (2) on the surface of the filter (3) – which is it – are they caught in the channels or are the caught on the surface of the filters. There are multiple instances of these types of errors.

Appropriate correction is required.

6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 4 - micro channel plate filled by liquid nutrient media and placed on examined surface, or a surface covered by nutrient media and micro channel plate put on after. (Could not find any support in the specification) Claim 1 – a frame in order to form long cylindrical microcolonies. (The only reference to a frame is on page 6 and that is that the method could be realized utilizing a frame but not that the frame is utilized for form long cylindrical colonies.)

7. A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

8. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the

claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 2 recites that the micro colonies can have a shape other than a cylinder (line 2). However, claim 1 clearly states that the micro colonies are formed into cylinders (line 4).

9. Claims 3-5 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 3-5 state that the device is utilizing liquid nutrient media for the growth of the cells/micro colonies. However, claim 1 clearly states that the growth is on a solid nutrient media.

10. Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 3 recites "trapped cell produces suspension of cells in a channel (lines 1-2). However, claim 1 recited a "frame in order to form long cylindrical micro colonies" (line 4). A suspension is not a microcolony with a defined shape.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in

the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The application is not enabled for what Applicant is claiming. The Specification appears to be describing a very vague and unclear invention. While the examiner cannot understand what Applicant is claiming, the following analysis of Applicant's invention is offered.

The breadth of the claims is very broad. They read on any living cell, be it any bacteria, fungus, virus, yeast, human cell of any kind, i.e. any tumor cell, etc. that will grow into a micro colony utilizing a device of some sort (parameters unknown and unclaimed) that utilizes optical instruments, of which again there are a vast variety, fluorescence, excitation, microscopy, coagulation, bubbling, cooling, immobilization, staining, etc., by changing optical characteristic of light passing through the channels. Thus, the number and type of cells is as vast as there are different bacterium, fungi, viri, yeast, human cells and their abnormalities, i.e. virtually limitless, as cells are constantly mutating and different types of viri and cancers are being discovered.

The nature of the invention appears to be the utilization of a device for rapid detection of live cells by detection of micro colonies produced by growing those cells into micro colonies in small and thin channels of the device and by increasing visualization with optical instruments by changing optical characteristics of light passing through the channels. Unfortunately since the specification is so poorly written, this is only speculation.

Micro devices are known in the art and are utilized for hybridization, detection and growth of DNA, RNA, proteins and the like, as well as for biological synthesis. Growth of micro colonies is known, and optical detection by various methods is also routine.

The level of one of ordinary skill in the art would be that of a Ph.D. for designing such devices and determining the appropriate parameters for each type of cell.

The field is very unpredictable even for microfluidic systems alone. The known techniques do not lend themselves for rapid prototyping and manufacturing flexibility. Additionally, the tool-up costs of these techniques are quite high and can be cost-prohibitive, Synthesis is extremely variable compared to other fields, as it would be difficult to fabricate a single device capable of performing all of the various functions and handling all of the various chemistries that would be required to perform synthesis generally because various steps of a synthetic process require different material compatibilities and different reaction steps, the same is true of culturing different cell lines. Thus fabricating enough devices to enable a broad range of protocols would probably be impractical using conventional techniques. While various conventional tools and combinations of tools are utilized in biological products in conventional macroscopic volumes, attempts to perform biological synthesis in microfluidic volumes have been stifled by difficulties in making tools for synthesis at microfluidic scale and then integrating such tools into microfluidic devices. Additionally, difficulties arise by attempts to incorporate multiple synthesis tools for multi-step synthesis. See US 2002/0185184 [0005]-[0008].

The Applicant provides some guidance as to the size of the grid, i.e. the minimal size and an example suitable for this purpose, i.e. a Micro Channel Glass Plate (MCGPs) and specifies regular diameters, lengths and capacities. See pg. 3, paragraph 1. However, he states that other grids or MCGPs could b useful also but provides no guidance. Id. Moreover, the Applicant does not adequately describe the features of the device or how to grow any of the micro colonies in the device utilize a filter and a frame to create the shape of the colonies to increase their

visualization. He merely states that it occurs and fails to show how the shape of the colony is formed. Additionally, the Applicant does not demonstrate the mechanism by which the change in shape of the micro colony would occur or if it would naturally grow into a cylindrical colony or a shape other than a cylindrical colony. Even in the detailed description, presuming that the device claimed is the device set forth in Fig. 2, the inventor fails set forth an enabling description or to demonstrate that any cells would be captured to grow any micro colonies –

The first step of "liquid or air sample containing microorganisms filtrated through the device – How? He states that the cover lid is taken off before filtration, and special funnel for liquids, which is not shown, could be adjusted. Thus, how does the filtration work, he even states that "during this process, cells **if any** are caught in some of the micro channel plate (2) on the surface of the filter (3). In the first instance, we don't know how the funneling system works, looks, functions and it is "special" to the device. Second, the filtration process is never described, nor is it set forth as to be known to one skilled in the art. Third, the cells are caught in some of the micro channel plate, which are long and thin and also on the surface of the filter, which according to the Figure is underneath the micro channel plate. It is not described or explained, how the cells get from the channel down to the filter nor is it explained how the channels are kept from becoming cross contaminated if the filter is continuous and the channels are open at the bottom, as the lid is only at the top. Fourth, there is the statement that no cells may be caught and thus, no micro colonies grown. The next step the inventor describes is that the porous support (4) which is adjusted to the holder (6) is removed and the lid is replaced to prevent further contamination. This leaves only the filter, and holder with the micro channel plate with or without cells. The inventor then states that the filter and holder with micro channel

plate is placed on the surface nutrient media (again not shown how to be done) or in a container with liquid nutrient media (again not shown how to be done). There is no description of how this is accomplished with the device to support it, prevent contamination, prevent cross-contamination, describe how either the solid or nutrient media is set up. The inventor states that nutrient media wet filter and support the growth of cylindrical micro colony or penetrate through filter in a channels, and supports the growth of suspended microorganisms. However, the inventor does not describe how this shapes the colony, as the filter is flat underneath the device, as depicted, does not show any rationale that the cells would do anything other than grow at the bottom of the channel. The inventor does not even describe the any levels of solid or liquid nutrient media to be utilized to achieve and promote sufficient growth, to show sufficient wetting of the filter, etc. The inventor next describes incubation as occurring for a needful time at appropriate temperature. Again this just invites experimentation as no parameters are set forth and the invention relates to an infinite variety of cells as set forth above. The next steps are written in the future tense and are not described as to how they would be accomplished, other than the device is placed in a container. The container is not described nor the method of placing the device in the container. The inventor then states that the device is placed under light or fluorescent microscope for detection and enumeration, i.e. the amount that corresponds the amount of cells trapped on the surface of the filter. However, the filter is underneath the micro channels and as previously described the colonies are grown in the channels and may not be attached to the filter but the channels themselves - this invention is based on growing of micro colonies in thin and long micro channels, instead of regular grown on flat surface of solid nutrient media or flat surface of filter placed on nutrient media (pg. 2, paragraph 4). There is no

mention of removal of the cells from the channel once grown, i.e. through centrifugation or the like.

The inventor states that experiments show that micro colonies can be grown in micro channels but does not provide any working examples. He only extrapolates data from calculations to illustrate his hypothesis with one type of bacteria – E. coli. While the inventor explains that micro colonies can be grown in micro channels that look like dart dots, it is not clear from this example that the micro colony forms the shape of cylindrical or any other particular shaped micro colonies. There is a conclusory statement about cylindrical micro colonies but the observation states that "[t]he channels containing micro colony look like dark dots." Dots are circular, i.e. spheres, or blobs, and not cylindrical. There is no discussion about the procedure set forth for growing the E. coli micro colonies or the device utilized and whether it contained any or all of the components of the claims. Additionally, the inventor specifically states that he did not utilize artificial substrates or other physical methods to change optical characteristics. The inventor states that experiments show that "**Experiments show** 10 layers of colorless small cells (for example E. coli) are enough to find visual difference between micro channels contain cells and empty micro channels using regular light microscope with even small magnification of X100. Smaller diameter of the channel needs smaller amount of cells to create 10 layers of cells in the channel. Table 1 represent amount of layers of E. coli that **could be** produced in micro channels of different diameters in different time." See pg. 4, paragraph 2. No where does the inventor provide evidence of the "experiments" or objective proof that it works. The specification is written in the future tense, i.e. "Those colonies **will obtain** high cylindrical shape." … "This **method could be** realized with a simple device …" … "The **time of analysis**

could be reduced, and **sensitivity could be enhanced** by the usage of channels of smaller diameter and substances produced color or fluorescence."

Due to the lack of disclosure about the device itself, i.e. any specifics other than the micro channel glass plate and the lack of specifics about how to carry out the method, one would have to design the entire device, including all the parts that are not illustrated or described in any detail and then attempt to determine if they would grow the micro colonies and then attempt to design the fluorescing portions, as well. There is not even one example of a device that is complete with any range of measurements and relationships, even the filter is not described with any specificity. Moreover, the method of using the device also lacks most fundamental description. One would be unable to determine how to practice the method on the device as described, as one would not know how to create the device in order to begin to practice the method and the method is not described sufficiently so that one could practice it, for the reasons set forth above.

Thus, a number of factors would prevent one of ordinary skill in the art from practicing the invention without undue experimentation.

The specification fails to give adequate direction and guidance as to both the method for rapid detection of all possible live cells by detection of micro colonies produced by the cells through growth of the micro colonies in small and thin channels of "the device" since the claimed invention is devoid of structural and or functional constraints regarding the cells encompassed by the claimed invention and how such growth could be encompassed. The specification fails to give adequate direction and guidance as to the device itself, since the claimed device is also devoid of structural and function constraints regarding the nutrient media,

the frame, the filter, the containers, the funnel, the fluorescence substances, the mechanism for shaping the colonies as the frame is never discussed in this fashion and the filter is utilized as a flat surface and the micro channels are not defined as providing the shape.

There is a significant lack of working examples. The specification hints that there are experiments that utilize micro channels but never discuss them in any detail or show that they utilize any device that is at all similar to that claimed or show in Figure 2. Moreover, the only Table of data is based upon calculations of what could occur, not actual representative data, is again not based upon any device with the claimed attributes and is based only upon one type of cell.

The breadth of the claims is open ended regarding both the type of cells to be grown and their method/condition of growth and the structure and relationship of the parts of the device utilized in the method.

The state of the prior art is such that growth of micro colonies there is difficulty in creating the micro devices and measuring the volumes of reagents and solvents to perform the syntheses on a microfluidic scale, as well as performing the integration necessary, as set forth above. Applicant fails to teach these in his specification, i.e. specifically does not teach the funnel, how measuring of any of the reagents, cells, parts to go with the micro channels (if prefabricated) will be designed and utilized.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors. For example the phrase "from micro channel plate", "with shape another than cylinder", etc. The claims are also lacking "a" "an" and "the" before nouns.

The term "rapid" in claim 1 is a relative term, which renders the claim indefinite. The term "rapid" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. One can not determine how quickly the detection must occur in order to be "rapid" or not "rapid" – is it one second, 10 seconds, one minute, 10 minutes, an hour – what are the parameters that make the detection rapid versus a regular detection.

Claim 1 recites "growing of micro colonies in a small and thin channels" in line three. It is unclear if these are the same micro colonies of the preamble or different micro colonies.

Claim 1 recites "a small and thin channels" in line three. It can either be –a small thin channel— or – small and thin channels – however, the grammar is confusing and it is unclear, whether Applicant intends for there to be one channel or multiple channels utilized by the device.

Claim 1 recites the limitation "the device" in line 3. There is insufficient antecedent basis for this limitation in the claim. No device has been previously set forth and the previous feature,

i.e. the channels are not clearly interrelated to the rest of "the device" as claimed later. The structure of the device is not clearly defined.

Claim 1 recites the limitation "their visualization". It is unclear whether this is referring to the micro channels' optical characteristics or that of the micro colonies.

Claim 1 recites a "filter to trap cells and frame in order to form long cylindrical micro colonies". It is unclear whether the filter is acting in the capacity creating the long cylindrical micro colonies or whether there is a separate component that acts to create the cylindrical shape, i.e. a scaffold, micro beads, etching, etc. or the micro channel shape itself.

Claim1 is rejected as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the introduction of the solid nutrient media. The claim recites "as a result of growth on solid nutrient media in order to increase their visualization with optical instruments ..." How can there be anything as a result of growth on solid nutrient media, when there was no solid nutrient media present?

Claim 1 is rejected as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: how and where is the solid nutrient media incorporated into the device; what facilitates or in what manner do the cells come into contact with the solid nutrient media to grow upon it to form micro colonies.

Claim 1 is rejected as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the method

by which the micro colonies are produced by these cells, is it by cell division, RNA, transference of a smaller micro colony, splicing, etc..

Claim 1 is rejected as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the method by which the optical instruments are integrated and utilized by the device and what these optical instruments are – a pair of eyes, different forms of microscopes, electrochemical devices, quartz crystal microbalance, surface plasmon resonance, ellipisometry, photodetector, optical tweezers, measuring optical radiation, etc. – are the channels separately detached, is the microchannel plate inserted, are process steps involved prior to visualization and the channels put into another device.

The phrase "changing optical characteristics" in claim 1 is a relative term, which renders the claim indefinite. The phrase "changing optical characteristics" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. How much of a change is necessary and to what degree is enough of a change – is a speck that changes the optical characteristics enough or is there a mean deviant – what about contamination – or is it dependent upon the micro colony and the optical instrument and the procedure and the shape – none of this is defined in the specification.

Claim 2 is vague, indefinite and unclear. It recites "micro colonies formed in long and thin channels with a shape another than cylinder." This does not seem possible as claim 1 clearly states that the micro colonies for long cylindrical micro colonies. There is nothing in claim 2 to change the shape and it appears that the size of the micro channel and the nutrients along with

the shaping would permit only one colony to form. There is nothing in the Specification to the contrary nor does it teach the formation of two colonies per channel.

Claim 2 is unclear because of the phrase "another than cylinder". It is not clear whether Applicant intends to eliminate all shapes other than cylindrical or whether there is another meaning intended by this language.

Claim 3 is vague, indefinite and unclear. It recites "trapped cell produces suspension of cells in a channel". However, there is already the formation of long cylindrical micro colonies and this is contradictory – are both occurring, is there no longer a micro colony forming, if both are occurring what is being measured and how – the micro colony or the suspension or both and what optical characteristic. None of this is set forth in the Specification.

Claim 3 is vague, indefinite and unclear. It recites "device placed in liquid nutrient media and trapped cell produces ...". Is the device placed in liquid nutrient alone or is it placed in both liquid nutrient media and trapped cell ... if it is placed in both liquid nutrient media and trapped cell how are the trapped cell trapped – by filter and then how is this structurally set up with the device. There is no description in the Specification and it is not part of the drawings.

Claim 3 is as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the mechanism by which the liquid nutrient media and trapped cell is introduced to the device prior to producing the suspension of cells – in what way or manner is the liquid nutrient media introduced and made available, i.e. introduced into the separate micro channels, in some form of container (made out of what type of material and protected in what way from contaminants), how is the nutrient material introduced, i.e. pipette, funnel (mentioned in the Specification as being of a particular

design but not ever described or shown), syringe, absorbed through the container into the channel (what about the filter), what about the trapped cells and how are they introduced.

Claim 4 is as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the mechanism by which the liquid nutrient media fills the micro channel plate and is placed on the examined surface – in what way or manner is the liquid nutrient media introduced and made available to the micro channel plate, i.e. is each individual channel filled, in some form of container (made out of what type of mater and protected in what way from contaminants), syringe, pipette, funnel (mentioned in Specification as special device but not described nor shown), airborne, submersion, etc., how is nutrient material introduced with the filter, and what is it placed on, how (see below), in what amounts, i.e. minimal amount to avoid drying or maximum amounts to avoid cross contamination, what about incubation so that the colonies can grow; the mechanism by which the surface is covered by nutrient media (see above about the surface container, loading, filter, etc. – noting also that the media could be gas or solid and how would that be delivered) and micro channel plate put on after – there is no correlation between these steps and growing micro colonies as there is no introduction of cells, how is the micro channel plate put on, how do the cells get from the surface to the channels, what is the interrelationship of the these two components, put on after when, see statements above as they are all applicable.

Claim 4 is vague, indefinite and confusing. How is the micro channel plate filled by liquid nutrient media? How is the micro channel plate filled? What is the examined surface that it is placed upon? Is there any incubation going on with the cells and the liquid nutrient media? How are these steps connected? What surface is covered by a nutrient media? Is that nutrient

media a liquid nutrient media or is it a solid nutrient media or can it be either? How do the cells come into contact with this media? Is contamination an issue? Where is the filter in relation to this media? What about the frame? How long after is the micro channel plate put on the surface? What type of container holds this media?

Claim 4 is vague, indefinite and unclear. It recites "placed on examined surface". It is unclear what is meant by this phrase. Is it a sterilized surface, is it a surface that has been examine for cells and other contaminants, is it a surface to be examined ...

Claim 5 is vague, indefinite and unclear as the phrase "other substance to colorize cells" unclear as the claim already states produced colored or fluorescent substance and the Specification does not provide further guidance on any other types of colorization.

Regarding claim 5, the phrase "like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

The phrase "highly colored liquid nutrient media" in claim 5 is a relative term which renders the claim indefinite. The term "highly colored liquid nutrient media" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is problematical to differentiate between colored and highly colored and no concentration levels or amounts are provided as guidance.

The phrase "increasing of light transmittance" in claim 5 is a relative term which renders the claim indefinite. The phrase "increasing of light transmittance" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of

ordinary skill in the art would not be reasonably apprised of the scope of the invention. Applicant does not disclose what range or amount of change/increase of light transmittance should be observed in the channels to provide any detection of growth versus aberrant fluctuations, contaminants, or other factors that might affect the equipment or cells, i.e. cell death or migration.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited. See, e.g. US 6,743,581 and 6,767,706.

Applicant has not defined the in invention in clear concise terms. The method needs to be presented in clear, logical steps that provide for a process with definite steps and for a definite "device" to be used in that process.

13. An examination of this application reveals that applicant is unfamiliar with patent prosecution procedure. While an inventor may prosecute the application, lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

Applicant is advised of the availability of the publication "Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office." This publication is for sale

by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer I. Harle whose telephone number is (571) 272-2763. The examiner can normally be reached on Monday through Thursday, 6:30 am to 5:00 pm,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on (571) 272-0974. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer Ione Harle
November 3, 2004

MICHAEL MELLER
PRIMARY EXAMINER